REMARKS/ARGUMENTS

In the Office Action, the Examiner noted that claims 1, 3, 4, 6, 7, 9-11, 16-22, and 25-32 are pending in the application and that claims 1, 3, 4, 6, 7, 9-11, 16-22, and 25-32 are rejected. By this argumentative response and request for reconsideration, claims 1, 3, 4, 6, 7, 9-11, 16-22, and 25-32 remain pending in this application.

Rejections Under 35 U.S.C. §103

Claims 1,3, 4, 6, 7, 9-11, 16-22, and 25-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Murad, et al.* (U.S. Patent No. 6,526,389), and further in view of *McDonough, et al..* (U.S. Patent No. 6,115,693).

With regard to claims 1 and 28, the Examiner has <u>incorrectly</u> asserted that *Murad* teaches "...at least one computer program, performed by the profiling engine, and operative to define behavior profiles defined at least in part by probability distributions, using data from the telephone call records, as data cubes and derive similarity measures on patterns extracted from the behavior profiles (col. 8, lines 61-65, col. 10, lines 24-36 represented by the method being computer implemented, and where the behavior profiles are represented by prototypical first behavior profiles and similarity measures are represented by matches and differences, col. 5, lines 10-14, where the profile 304 is shown to represent a multi-dimensional probability distribution of calls)...".

Contrary to the Examiner's assertion, *Murad* does <u>not</u> teach the use of data from telephone call records configured as data cubes. In contrast, Applicant's technique represents data by multidimensional cubes via hierarchical dimensions and measures. Furthermore, OLAP scripts as a high-level language for multi-dimensional, multi-level data mining. Customer profiles, patterns, similarity measures, and association rules can be modeled as cubes. An OLAP server then efficiently computes these items using cube operations via the OLAP server. OLAP implementation enables multi-dimensional, multi-level analysis over cubes providing enhanced expressive power (e.g., richer association rules)

by integrating OLAP style drill down, rollup operations with data mining tasks. Applicant's technique represents association rules as cubes which can be generated by cube operations, can be maintained as cube cells, and is scalable to large data sets. Furthermore, the technique allows definition of new kinds of multilevel, multidimensional association rules with enhanced expressive power. *Murad* does <u>not</u> teach or suggest such multidimensional, multi-level data mining techniques. The Examiner is simply wrong. Applicant's technique performs operations on data cubes, *Murad* does <u>not</u> perform operations on data cubes, and the associated claim limitations found in independent claims 1 and 28 are not taught or suggested by *Murad*.

The Examiner also asserts that *Murad* teaches "...wherein the behavior profiles are provided as two input calling pattern cubes, C1 and C2, and a similarity cube, Cs, is an output of a comparison between C1 and C2, wherein the similarity cube Cs, represents a pair of corresponding sub-cubes of C1 and C2, (col. 8, lines 15-20, where the two input calling pattern cubes are represented by two instances of the second level profile where the second level profile represents extracted call prototypes)." Applicant's technique uses an OLAP server to provide memory management and efficient computation over data cubes, with OLAP servers functioning as data summarization engines within a computational pipeline. Association rules are represented as cubes which can be generated by cube operations, can be maintained as cube cells, and can be scalable to large data sets. Furthermore, applicant's technique allows for definition of new kinds of multilevel, multidimensional association rules with enhanced expressive power when performing data mining. *Murad* simply does not teach or suggest these features; namely, a data warehouse and OLAP server based profiling engine architecture.

The Examiner further asserts that *Murad* teaches "...and wherein C1 and C2 are count-cubes, a sub-cube is treated as a bag, and cell-wise comparison results are summarized based on bag overlap, wherein each cell of Cs represents the similarity of a pair of corresponding sub-cubes, a cube having a set of dimensions and each cell of the cube being identified by a value from each of the dimensions, (col. 7, lines 3-57, [where it shows that a comparison between qualitative profiles of a daily prototype and of the daily profile under

examination as determined on the basis of the CD distance function. In this case, the Diff value represents each cell of Cs since it shows how similar/different the qualitative profiles of a daily prototype, which arederived from instances of a second level profile. This comparison, showing the distance factor represents the bag overlap. The overlap is shown by this distanc facto since it is shown that the distance stays at or below the predetermined threshold])." Applicants' disagree. *Murad* simply does not teach or suggest these features; namely, count-cubes, sub-cubes, and bag overlap. *Murad* does not teach efficient computation over data cubes. A distance factor is not the same as bag overlap. The Examiner has failed to teach or suggest Applicants' claimed feature.

The Examiner then asserts that *Murad* does <u>not</u> teach "...an On Line Analytical Processing (OLAP) based scalable profiling engine communicating with the data warehouse and operative to build and update customer behavior profiles by mining the customer telephone call records that flow into the data warehouse, (col. 11, lines 29-34 and col. 12, lines 50-53, where the statistics represent the customer profiles).". The Examiner then asserts that *McDonough, et al.* teaches this claimed feature. The Examiner then asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate OLAP into the *Murad* patent with the modification of accurately analyzing trends in a telecommunications environment.

Applicants disagree with the Examiner's assertion. First, *McDonough* does not teach the implementation of an "...OnLine Analytical Processing (OLAP) based scalable profiling engine communicating with a data warehouse and operative to build and update customer behavior profiles by mining the customer telephone call records that flow into the data warehouse ...". Furthermore *McDonough* does not teach "...the behavior profiles are provided as two input calling pattern cubes, C1 and C2, and a similarity cube, Cs, is an output of a comparison between C1 and C2, wherein the similarity cube, Cs, represents a pair of corresponding sub-cubes of C1 and C2, and wherein C1 and C2 are count-cubes, a sub-cube is treated as a bag, and cell-wise comparison results are summarized based on bag overlap, the count cubes having non-negative

integer call values, and the bag overlap enables comparison of corresponding sub-cubes of distinct count cubes."

Instead, *McDonough* merely teaches or suggests the incorporation of an OLAP tool (see col. 11, line 33) into a quality center for a virtual sales and service center, and the incorporation of OLAP capabilities into such a quality center to enable quality center executives to gather performance information and analyze trends and statistics for operational management of the virtual environment (see co. 12, lines 50-54).

In order to establish a *prima facie* case of obviousness, the Examiner must provide: (1) One or more references; (2) that were available to the inventor; and (3) that teach (4) a suggestion to combine or modify the references; (5) the combination or modification of which would appear to be sufficient to have made the claimed invention obvious to one of ordinary skill in the art.

Here the Examiner has failed to establish one or more references available to the inventor that teach a suggestion to combine or modify the references to achieve the use of an OLAP based scalable profiling engine into a customer profiling apparatus that uses data cubes, calling pattern cubes, and similarity cubes, with sub-cubes treated as a bag and cell-wise comparison results are summarized based on bas overlap (where a sub-cub is treated as a bag). The combination or modification would not appear to be sufficient to have made the claimed invention obvious to one of ordinary skill in the art. The Examiner has impermissibly used hindsight analysis is combining these references.

The same argument is applied with regard to the limitations in independent claims 11, 17, and 25.

Hence, Applicants assert that claims 1, 3, 4, 6, 7, 9-11, 16-22, and 25-32 overcome the 35 U.S.C. §103 obviousness rejection, and withdrawal of the rejection is respectfully requested.

Withdrawal of these rejections is respectfully requested.

CONCLUSION

For all the reasons advanced above, Applicants respectfully submit that the application is in condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the undersigned respectfully requests a telephone interview before issuance of any such subsequent action.
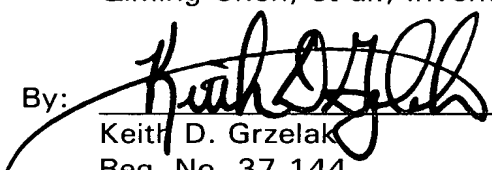
Respectfully submitted,

Qiming Chen, et al., Inventors

Date: __11/15/04__   By: _____

Keith D. Grzelak
Reg. No. 37,144

November 15, 2004
(509) 624-4276

Serial No.: 09/443,684
Case No. 10990654-1
Amendment B